

1 **Table S1:** Comparison of physiological traits of *merA*⁺ Aquificae cultures and negative
 2 control¹

Characteristic	<i>Hydrogenobaculum</i> sp. Y04AAS1	<i>Hydrogenivirga</i> sp. 128-5-R1-1	<i>Persephonella</i> <i>marina</i> str. Ex-H1
Origin	Obsidian Pool, Yellowstone National Park	Eastern Lau Spreading Center, South Pacific	East Pacific Rise, Mid-Ocean Ridge
<i>merA</i> Homolog	+	+	-
Present			
Optimal Growth Temperature (°C)	55	70	70
Optimal pH	4.5-5	6	6
Electron donors	S ^o , S ₂ O ₃ ²⁻ , H ₂	S ₂ O ₃ , H ₂	S ^o , S ₂ O ₃ ²⁻ , H ₂
Electron acceptors	O ₂	O ₂	O ₂ , NO ₃ ⁻
Carbon Source	CO ₂	CO ₂	CO ₂
Growth Medium	Boone's Medium	Boone's Medium	Boone's Medium
Used	#5 ²	#2 ³	#2 ³

3 ¹Physiological data from the Aquificales Data Warehouse

4 (<http://alrlab.research.pdx.edu/Aquificales>)

5 ²Shima et al. 1993(3)

6 ³Boone et al. 1989(1)